MOUNT WILSON OBSERVATORY

The positions and areas of sun spots furnished by the Mount Wilson Observatory for publication in the MONTHLY WEATHER REVIEW are taken from the daily records of the magnetic polarities of sun spots. These records are made at the 150-foot telescope by projecting the image of the sun, mean diameter 42.8 centimeters, upon a sheet of paper and sketching the spots. The heliographic latitude and longitude of each group is read from a disk on which the circles of solar longitude and the parallels of latitude have been drawn for every 10 degrees. Twenty of these disks are available for different diameters of the image and different values of the heliographic latitude of the sun's center.

To determine the areas a réseau, ruled to square millimeters, is placed on the sketch and the area of each group counted in square millimeters. The areas are then reduced to millionths of the visible hemisphere, taking into account the actual diameter of the image. The distance of each group from the center of the disk is then measured and the projection factors obtained to correct the areas for foreshortening.

The solar photographs made at the 60-foot tower telescope, sun's mean diameter 17.1 centimeters, are compared with the sketch and, if any spots have been omitted, they are measured on the photograph by methods similar to those described in the *Greenwich Photoheliographic Results.*—*Seth B. Nicholson.*

Positions and areas of sun spots

Date	Eastern standard civil time	Heliographic		Area	
		Longitude	Latitude	Spot	Group
1927	Hr. min.	°	°		
Jan. 1	13 35	−65.0	+20.0	39	
(Mount Wilson.)		−21.0	+9.5		385
		+7.5	−8.0		625
		+49.0	−11.0	10	
		+62.0	+19.0		7
Jan. 13	14 20	−78.0	+27.0		594
(Mount Wilson.)		−59.0	−20.0		32
		+19.0	−20.0	4	
		+31.0	+8.0		255
		+40.0	−17.5		197
		+66.0	+21.0	9	
		+70.0	−16.0		499
Jan. 14	13 40	−87.0	−13.0	199	
Mount Wilson.)		−62.0	+26.0		740
		−43.0	−18.0		8
		+45.0	+8.0		19
		+55.0	−17.0		16
		+83.0	−18.0		59
Jan. 23	17 30	−57.0	−6.0		55
(Mount Wilson.)		+30.0	+34.0		181
		+30.5	−15.0		427
		+62.0	+26.0		529
		+65.0	+10.0		35
Jan. 28	11 5	−84.0	−12.0	44	
(Mount Wilson.)		−71.0	+12.0		246
		−58.0	−17.0		21
		−7.0	−9.0		25
		+7.5	−8.5		44
		+41.0	−11.0		5
		+58.0	+13.0		10
Feb. 1	11 54	−67.5	+22.0	154	
(Naval Observatory.)		−59.0	+22.0		62
		−38.5	−28.0		247
		−35.0	−13.5		309
		−17.0	+11.0		185
		−7.0	−15.5		370
		+34.5	−16.5		494
Feb. 2	11 51	−79.0	+11.0	123	
Naval Observatory.)		−70.0	+17.0	93	
		−53.5	+24.0		62
		−45.0	+24.5		31
		−27.5	−15.5		309
		−27.0	−27.5		154
		−17.5	−11.0	31	
		−6.0	+13.5		46
		0.0	+11.0	108	
		+6.0	−15.5		463
		+47.5	−17.5		525

Positions and areas of sun spots—Continued

Date	Eastern standard civil time	Heliographic		Area	
		Longitude	Latitude	Spot	Group
	Hr. min.	°	°		
Feb. 3	11 47	−80.0	−15.0	154	
(Naval Observatory.)		−64.0	+9.5	123	
		−57.5	+15.0	154	
		−40.5	+22.5	15	
		−32.0	+24.5		26
		−18.0	+23.0		62
		−14.0	−16.0		309
		−14.0	−28.0		123
		−4.5	−11.0	31	
		+8.0	+15.5	10	
		+12.5	+11.0	123	
		+19.5	−16.0		463
		+61.0	−17.5		525
Feb. 4	13 47	−70.0	−14.0		370
(Naval Observatory.)		−49.5	+10.0	93	
		−42.5	+15.5		93
		−17.0	+25.0	31	
		−5.5	+24.0	15	
		−4.0	−28.0		26
		+1.0	−16.0		370
		+4.5	−28.0		62
		+10.5	−11.0		15
		+28.0	+11.0	93	
		+35.5	−15.0		278
		+75.0	−18.0		463
Feb. 5	11 21	−51.	−13.		362
(Harvard.)		−34.	+10.	73	
		−28.	+15.		164
		+12.	−14.		438
		+15.	−26.	56	
		+38.	+9.	174	
		+46.	−14.		198
Feb. 6	18 20	−67.0	+13.0	10	
(Mount Wilson.)		−43.0	−8.0		10
		−40.0	−14.0		781
		−24.5	+7.5		14
		−24.0	−12.5		26
		−20.0	+10.0	83	
		−11.0	+16.0		471
		+12.0	+26.0		2
		+30.0	−17.0		518
		+33.0	−28.0		65
		+58.0	+12.0	133	
		+67.0	−13.0	204	
Feb. 7	11 53	−56.0	+14.0		31
(Naval Observatory.)		−33.0	−7.5		62
		−30.5	−14.0		556
		−15.5	−12.5		62
		−11.0	+9.0		108
		−1.5	+16.0		309
		+29.0	+25.0		46
		+39.0	−17.5		370
		+43.0	−28.0		46
		+66.0	+11.0	123	
		+78.5	−13.0		154
Feb. 8	10 31	−79.	−23.	175	
(Harvard.)		−53.	+20.		52
		−16.	−12.		557
		−17.	−6.		72
		0.	−12.	49	
		+3.	+6.		76
		+4.	+9.	46	
		+12.	+14.		291
		+40.	+22.		52
		+47.	−18.	362	
		+51.	−30.	88	
		+78.	+9.	170	
Feb. 9	11 48	−67.0	−27.5	123	
(Naval Observatory.)		−4.5	−8.0		93
		−4.0	−15.0		463
		+16.0	+5.5		278
		+18.5	+10.0	46	
		+26.5	+17.0		216
		+37.0	+26.5		31
		+58.0	+25.5		123
		+64.0	−17.0		309
		+70.0	−29.0	43	
Feb. 10	11 48	−54.5	−28.0	123	
(Naval Observatory.)		+8.5	−8.0		93
		+9.5	−15.5		432
		+29.0	+5.5		247
		+31.5	+10.0	46	
		+40.0	+17.0		154
		+69.0	+25.0	123	
		+82.0	−17.0		309
		+83.0	−29.0	62	
Feb. 11	11 47	−83.0	−13.0	123	
(Naval Observatory.)		−41.0	−28.0	123	
		+24.0	−8.0		309
		+24.0	−15.0		370
		+44.0	+5.5		247
		+45.5	+10.0	62	
		+51.0	+16.0		278
		+59.5	+18.0	62	
Feb. 12	11 56	−68.0	−13.0	123	
(Naval Observatory.)		−28.0	−28.5		123
		+37.5	−8.0		185
		+39.0	−13.5		401
		+58.5	+6.5		154
		+59.0	+10.5	46	
		+70.0	+17.5		123

Positions and areas of sun spots—Continued

Date	Eastern standard civil time	Heliographic		Area	
		Longitude	Latitude	Spot	Group
	Hr. min.	°	°		
Feb. 15 (Naval Observatory.)	11 45	−48.0	+32.5		93
		−37.0	+11.0		123
		−29.5	−13.5	123	
		+11.0	−28.5	93	
		+17.5	+13.0		31
		+79.5	−13.0	309	
Feb. 16 (Naval Observatory.)	11 31	−37.0	+32.0		62
		−23.0	+10.5		216
		−17.0	−14.0	123	
		+24.5	−27.0	77	
		+34.0	+15.0	31	
Feb. 17 (Naval Observatory.)	11 45	−62.5	+12.0		185
		−25.0	+34.0	31	
		−8.0	+10.5		154
		−4.5	−13.5		123
		+37.5	−27.5	93	
		+49.0	+14.0	31	
Feb. 18 (Naval Observatory.)	12 1	−52.0	+12.5		31
		−49.0	−9.5		31
		−44.0	+11.5		93
		−12.0	+34.0	31	
		+4.5	+10.5		123
		+9.5	−13.5	108	
		+50.0	−27.5	93	
Feb. 19 (Mount Wilson.)	15 45	−33.0	−10.5		73
		−32.0	+12.0		17
		−1.0	+18.0		1
		+3.0	+34.0		13
		+20.0	+10.0		27
		+25.0	−13.0		124
		+67.0	−29.0	24	
Feb. 20 (Mount Wilson.)	13 50	−85.0	+13.0		83
		−21.0	−10.0		154
		−19.0	+12.0		12
		+15.0	+34.0	10	
		+33.0	+11.0		13
		+36.0	−14.0		137
		+79.0	−28.0	36	
Feb. 21 (Naval Observatory.)	12 36	−68.0	+13.5	123	
		−59.5	−26.0	31	
		−6.5	−9.5		154
		+46.0	+15.0	15	
		+49.0	−13.5	108	

Positions and areas of sun spots—Continued

Date	Eastern standard civil time	Heliographic		Area	
		Longitude	Latitude	Spot	Group
	Hr. min.	°	°		
Feb. 22 (Naval Observatory.)	11 45	−55.0	+13.5		123
		−47.5	−26.0		31
		−30.0	+11.5		46
		+7.0	−10.5		185
		+7.0	−18.5		31
		+57.5	+12.5	31	
		+60.5	−14.0	108	
Feb. 23 (Harvard.)	10 27	−66	−13	41	
		−36	+14		58
		+20	−9		210
		+73	−15	139	
Feb. 24 (Naval Observatory.)	11 48	−85.0	−18.0	139	
		−67.0	−18.5	15	
		−27.0	+14.0		46
		−3.0	+11.0		46
		+34.5	−10.5		123
Feb. 25 (Mount Wilson.)	14 20	−66.0	−18.0	147	
		−65.0	−25.0	21	
		−53.0	−18.0	16	
		−13.0	+13.0		40
		−12.0	−27.0		4
		−2.0	−20.0	4	
		+14.0	+11.0		18
		+54.0	−12.0		63
Feb. 26 (Naval Observatory.)	11 46	−52.5	−18.0	139	
		−40.5	−18.0	15	
		+1.0	+14.0		77
		+12.0	−18.0		31
		+66.0	−9.5		62
Feb. 27 (Naval Observatory.)	11 46	−64.0	+22.0	31	
		−42.0	−18.0		123
		−37.0	−24.5	10	
		+12.5	+14.0		123
		+17.5	−26.5		31
		+28.0	−17.5		15
Feb. 28 (Naval Observatory.)	11 45	−54.0	+22.0		62
		−27.5	−18.0		139
		−23.5	−12.0		31
		+27.0	+15.0		123
		+33.0	−25.0		26

AEROLOGICAL OBSERVATIONS

By WELBY R. STEVENS

With the exception of the mean temperatures at 4,500 meters above Ellendale, mean free-air temperatures were above normal at all aerological stations. Departures aloft were in general of the same order of magnitude as at the surface.

Humidity departures were unimportant, although they were mostly below normal at Broken Arrow and Royal Center and above normal at Groesbeck.

Vapor pressure departures were mostly positive.

North of the thirty-seventh parallel and east of the one hundredth meridian the general wind resultants near the surface were W. to NW.; south of this latitude they were W. to SW.; west winds prevailed aloft east of the one hundredth meridian. On the north Pacific coast southerly winds prevailed to 3,000 meters, above which they shifted to northerly; on the south Pacific coast southerly winds were general to 500 meters, above which they shifted to northerly. The resultants show that there was an excess of southerly component over the normal (or less northerly component) corresponding to the well-defined excess of mean temperature over practically the entire country. (See Chart III.) Perhaps the excess of mean temperature was due more to the lack of severe cold waves than deviation of resultant winds from normal. Correlation between wind direction and temperature is not perfect, as has been pointed out before, since southerly winds often transport cold air masses and northerly winds warm masses. Resultant velocities were about normal. The table below shows winds of 40 m. p. s. or more observed during the month.

Date	Station	Velocity (m. p. s.)	Altitude (m. s. l.)
1	Cheyenne	52 WNW	4,000
2	Washington	54 WNW	4,500
3	Ellendale	40 NW	5,000
12	Medford	44 N	5,750
13	Medford	45 NE	6,750
20	Cheyenne	60 WNW	3,250
24	Cheyenne	40 WNW	4,000
26	Atlanta	40 W	4,000
26	Due West	49 W	4,750

The unusually high WNW. winds observed at Cheyenne are of particular interest, since verifying pilot-balloon ascents were made on two different days during the month, when velocities considerably above normal were observed. In each case the verifying ascent showed the same general character as the first.

On the 1st and 20th Cheyenne was under the influence of almost identical pressure conditions. A LOW of great intensity was moving inland from the north Pacific coast with a rather weak area of high pressure over Colorado. On the 24th the situation was quite different. An area of high pressure was moving in from the NW. By the morning of the 25th it had overspread the entire Rocky Mountain region and the Plains States. Relative to the high winds frequently observed over Cheyenne, the Official in Charge says:

Perhaps the most level pass across the Rockies lies in southern Wyoming, with an elevation of 6,000 to 7,000 feet; on either side are ranges 9,000 to 12,000 feet; however, the Laramie Mountains form a barrier of lesser height than the ranges across the east end